



Kicking off the ECal pi0 calibration

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“Listen, it's more important than that”

- I used to have a team to support at the World Cup, and we used to be quite good at glorious failure, like beating the Netherlands in '78 but failing to qualify from the group by a single goal...



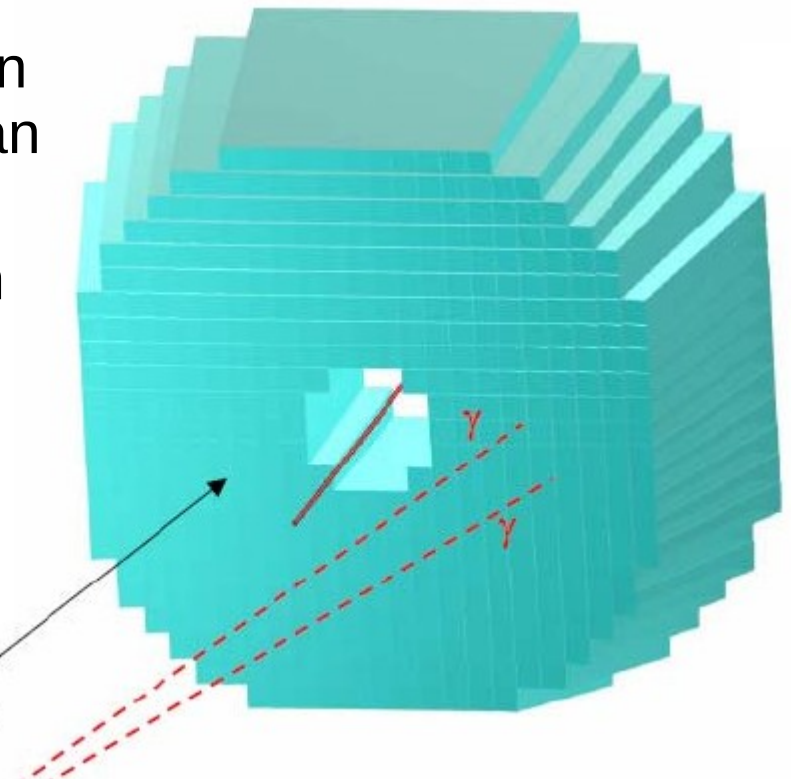
[1] Scotland 3 – 2 Netherlands, FIFA World Cup, Group 4 (1978)

Neutral pion calibration

- Neutral pions are a useful method of calibration in calorimeter devices
- Reaction is well-determined and understood
- CLAS IC, for example, performed this calibration
- Pions decay to two photons
- With knowledge of energy deposited in calorimeter by decay photons, pion can be reconstructed
- From beam energy and pion emission angle, pion decay signal can be estimated

$$M_{\gamma\gamma} = \sqrt{2E_{\gamma 1}E_{\gamma 2}(1 - \cos \theta_{\gamma\gamma})}$$

- Signal compared to this estimate and used to calibrate detector





Pion calibration in HPS ECal

- Crystal-by-crystal calibration
- Use two-cluster events to reconstruct pion mass
- Iterative process to align gains
- Based on known physics; Can provide long-term calibration in a way that LED system may not (particularly if LEDs suffer radiation damage. Which they probably don't)
- Task now assigned to Kyle, as a continuation of his work on pion trigger (in conjunction with Michel)
- I will support as a result of agreeing to do this calibration for CLAS12 FTCal
- Both detectors are cousins of CLAS IC → use IC code as starting point
- Priority lowered a little after calibration discussion last week